

Unsupervised noise reduction scheme for voice-based information retrieval in mobile environments

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Abstract This study proposes an unsupervised noise reduction scheme that improves the performance of voice-based information retrieval tasks in mobile environments. Various types of noises could interfere with speech processing tasks, and noise reduction has become an essential technique in this field. In particular, noise reduction needs to be carefully processed in mobile environments based on the speech coding system and the client-server architecture. In this study, we propose an effective noise reduction scheme that employs the adaptive comb filtering technique. A way of directly using several codec parameters during the filtering process is also investigated. In particular, we modify the conventional comb filter using line spectral pair parameters. To verify the efficiency of the proposed noise reduction approach, we conducted speech recognition experiments using the Aurora2 database. Our approach provided superior recognition performance under various noise conditions compared to the conventional techniques.

Keywords Unsupervised noise reduction · Speech recognition · Adaptive comb filtering · Line spectral pair · Mobile environments

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